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IX. *An Investigation of the Difference between the present Temperature of the Air in Italy and some other Countries, and what it was Seventeen Centuries ago: In a Letter to William Watſon M. D. F. R. S. by the Honourable Daines Barrington F. R. S.*

Dear Sir,

Read March 3, 1768. **I** Troubled you lately to procure from your Son Mr. Watſon, who is now in Italy, ſome answers to certain queries with regard to the temperature of the ſeaſons which commonly prevails there at preſent, and particularly whether the rivers of that country have been remembered to have had their ſurface frozen over.

I have often put the ſame queſtion to many of thoſe who have made the tour of Europe, and have always been answered in the negative: as moſt Engliſhmen however travel before they pay attention to facts of this ſort, I was deſirous of procuring information from thoſe whoſe obſervations might be more depended upon.

I have long entertained a notion that the ſeaſons are become infinitely more mild in the Northern latitudes than they were 16 or 17 centuries ago; and from this it hath happened that many paſſages in the claſſical writers deſcriptive of the Severity of the climates, have ſtruck me more than they would perhaps a common reader.

It will be immediately seen that the proofs of this assertion must depend upon accounts of the weather, and its effects in places, the situation of which we know with some precision, and which may be compared with the common meteorological observations in the same latitudes and spots at present.

If this same question should be agitated two thousand years hence, it might receive an absolute demonstration ; as a journal of the changes in a well-constructed thermometer would shew the temperature which prevailed in any particular place, during the present century.

No such accuracy can be expected from any passages in the classical writers ; but in order to state the alteration which may have happened in so long a course of years, the most proper method seems to be to compare their accounts with those of more modern travellers, who have equally wanted the assistance of a thermometer for their observations.

I shall for several reasons chiefly rely upon many of Ovid's letters from Pontus (though he was not only a poet, but a writer of most glowing fancy, and imagination), in which he describes the effects of cold at Tomos \* during his seven years residence there, and afterwards contrast this description with that of later travellers.

\* It is so called by Ovid, who resided there so long and understood the language of that country. It was however likewise styled Tomis and Tomi, the latter of which seems to have been the more general appellation, as the adjective formed from it is Tomitanus. Besides this, Ferrarius supposes it to be the same with the modern Temisware, most evidently taken from the ancient name in the time of Ovid.

Ovid was born at Sulmo in Italy, about ninety Roman miles S. W. from the capital :

“ *Millia qui decies distat ab urbe novem.*”

He afterwards resided chiefly at Rome, and was there at the time he received the Emperor's orders for his immediate banishment : I shall therefore consider him as then leaving the 42d degree of Northern latitude, the climate in which he was born, and continued to live.

He was thence removed to Tomos, which Dr. Wells, in his maps of ancient geography, places only in the 44th degree of Northern latitude : the change was therefore only of two degrees, and yet Ovid immediately describes the winter of Hudson's bay.

But, before I particularise any of the passages which prove the intenseness of the cold, which he there experienced, it may be objected that no credit is to be given to a melancholy poet, of a warm imagination and too exquisite feelings.

This argument, I admit, would have great weight, if he only complained of the excessive and intolerable cold which prevailed. The maxim of law, however, holds equally in natural philosophy\* “ *that he who means to impose or misrepresent never deals in particular facts,*” especially such as admit of an immediate contradiction, and in which he could not himself be deceived.

He saw with his own eyes the Euxine sea covered with ice :

“ *Vix equidem credar, sed cum sint præmia falsi*

“ *Nulla, ratam testis debet habere fidem :*

“ *Vidimus ingentem glacie consistere Pontum.*”

Lib. III. El. 10.

\* “ *Fraus versatur in generalibus.*”

But if you will not credit what he saw, he afterwards mentions walking upon this ice:

“Nec vidisse sat est, udum calcavimus æquor;

“Undaque, non *udo sub pede*, summa fuit.”

The sea thus frozen, not only bore Ovid who hath described himself to be very light and agile, but oxen and carriages passed over it:

“Perque novos pontes, subter labentibus undis,

“Ducunt Sarmatici barbara plaustra boves.”

Lib. III. El. 10.

When the poor banished poet, during this rigorous weather, wanted some generous wine to warm himself, it was presented to him in a state of congelation:

“Udaque consistunt formam servantia testæ

“Vina, nec hausta meri, sed data frustra, bibunt.”

This effect of cold was not experienced in London, situated in the 52d degree of Northern latitude, during the great frost in 1740.

Add to these proofs, that what he here mentions is not the effect of one particular hard and severe winter; he complains from year to year of nearly the same circumstances:

“Ut sumus in Ponto *ter* frigore constitit Ister,

“Facta est Euxini *dura ter* unda maris.”

Lib. I. El. 10.

The snow likewise in many places never dissolved during the summer:

“Quæque nec hoste fero, nec nive terra cares.”

“Frigore perpetuo Sarmatis *ora* riget.”

“Et solet in multis *bima* manere locis.”

I think therefore that what I have presumed to conjecture, may be rested upon the single testimony  
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of Ovid ; but, as there is with some so strong prejudice against facts from such a quarter, I shall endeavour to corroborate this authority, by descriptions of the same country, which we find in other writers of those centuries.

His contemporary Virgil speaks thus of the effects of cold in the same latitude :

“ Cæduntque securibus humida vina,  
“ Stiriaque impexis induruit horrida barbis.”

Georg. Lib. III. l. 349. & seq.

He likewise asserts that the snow.

“ ——— Septem affurgit in ulnas.”

Virgil indeed is also unfortunately a poet ; but his Georgics are perpetually relied upon as authority, not only by Pliny, but the later writers on husbandry.

Such credit is given to our own great descriptive poet Thomson, that the compilers of the Encyclopædie have almost entirely translated his *Seasons*, under the article *Zone* : nor is there perhaps a circumstance mentioned throughout those poems, which the most scrupulous, and minute naturalist may not rely upon.

I shall just mention the authority of one more poet, as he is scarcely more than a metrical geographer :

Dionysius, in describing the same country, speaks thus of the snow's never melting :

Σχετλιοι οι περι κεινον ενοικια Φωτες εχασι.

Αιει σφιν ψυχρη τε χιων, δρυμος τε δυσανης.

Περιγησις, l. 668.

I shall close these corroborating proofs of the cold which was experienced at Tomos, by a passage from another geographer, who is sufficiently prosaic not to admit of any objection, to his testimony, on account of a too lively imagination :

Απασα

Ἀπασα δὴ χώρα δυσχειμερῶς ἐστὶ, τῶν δὲ παγῶν ἡ σφοδρότης μαλίστα ἐκ τῶν συμβαινόντων περὶ τὸ ἑσμά της Μαωτιδῶς δηλῶς ἐστὶ, ἀμαρξέυεται γὰρ ὁ διαπλῆξ, ὥστε καὶ πηλὸν εἶναι, καὶ ὁδόν. Strabo, L. 7.

Thus is Ovid supported in that very material and striking fact of the ice being commonly strong enough to bear carriages.

It now remains to compare this account of the severity of the cold at Tomos, with that of more modern travellers, who have either been at the same place during the winter, or passed not very far distant.

Rubruquis, Marco Polo, Jean du Plan, Carpin, and Mandeville, were all of them on the borders of the Euxine Sea, and proceeded many degrees Northward; and yet we do not hear of any complaint with regard to the cold.

Busbequius travelled from Buda to Constantinople, in the midst of winter; nor does he mention any inconvenience, or interruption, from frost or snow. If it be said that his way did not lye through Tomos (or Temesware), to this it may be answered, that he crossed the same latitudes; to which it may be added, that there was no Euxine Sea to mitigate the severity of the cold.

I must likewise here make another observation, that it does not appear either from Ovid, who is so very minute in every particular relative to this country, or from any other traveller, that there are high mountains in the neighbourhood of Tomos.

Tournefort was on the Black Sea, in the beginning of April, and dwells much upon the very fine weather during the time he continued upon it. He observes, however, that, in the time of Constantine, the streight opposite to Byzantium was frozen over; and that

that in the year 401 the Euxine Sea was covered with ice, for twenty days together. These facts, therefore, struck him, as extraordinary.

Mottraye was in Crim Tartary, in the year 1711, during the months of November and December ; who is also entirely silent, with regard to any uncommon effects of cold.

These are all the travellers, whose works I have looked into, or could procure on this occasion. I do not take upon myself to say, that there may not be others, which have escaped me ; but I should not suppose the number to be great, as the Euxine Sea, and its neighbourhood, neither answers to the European traveller, in point of curiosity or commerce.

I have said in the outset, that I have some particular reasons, for fixing chiefly on Tomos, to make this comparison ; which arises from the country being precisely in the same state that it was in the time of Ovid ; this entirely excludes the common observation, *that the cultivation of a country will render the climate more temperate.*

We will now leave Tomos, and compare the accounts of the weather in Italy, with those of the present times : it being first premised, that the country was better cultivated, in the Augustan age, than it is now, which should consequently have made the temperature of the air more warm than it is now experienced to be.

The queries proposed to your son Mr. Watson relate to this comparison, and have occasioned my troubling you with this length of letter, since I have within these few days been fortunate enough to procure, through other hands, the information I could have wished on this head.

I shall



I shall begin with some passages from Virgil's Georgics, having already attempted to shew that no authority can be more relied upon.

This most excellent husbandman is constantly advising precautions against snow and ice in the management of cattle; and he may be generally supposed to give these directions for the neighbourhood of Naples \*, or Mantua his native country, where he does not evidently from the context mean some other parts of Italy:

“ Et multâ duram stipulâ, flicumque manipulis

“ Sternere subter humum, glacies ne frigida lædat

“ Molle pecus.” Lib. III. l. 297.

This relates to sheep; but that hardy animal the goat wanted the same attention during the winter:

“ Ergo omni studio, glaciem, ventosque nivales

“ Avertes.” Lib. III. l. 317.

Speaking afterwards of Calabria, the most Southern part of Italy, he expresses himself, with regard to the rivers being frozen, as what was commonly to be expected:

“ Et cum tristis hyems etiamnum frigore saxa

“ Solveret, & glacie cursus frænaret aquarum †.”

\* “ Illo Virgilium me tempore dulcis alebat

“ Parthenope, studiis florentem ignobilis otî.”

† It appears also by the sixth Satire of Juvenal, that the Tiber's being commonly frozen in winter supplied the ladies of Rome with a very extraordinary instance of implicit deference to the commands of the Egyptian priests:

“ Hybernium fracta glacie descendet in amnem,

“ Ter matutino Tiberi mergetur ————”

Pliny's favourite villa of Laurentinum was situated near the mouth of the same river; and, in the very minute description of its beauties and conveniences, he dwells much more upon the exposition of different parts of it to the warmth of the sun,

I am ashamed to be obliged to state so many authorities ; but, as the proof entirely arises from many such concurrent passages, I shall now support the testimony of Virgil by that of two naturalists, who were either Italians, or resided in Italy.

Pliny, in a chapter, *De natura cœli ad arbores*, and speaking of Italian trees, says, “ Alioqui arborum “ frugumque communia sunt, nives diutinas sedere.” Lib. XVII. cap. 2.

But perhaps the strongest proof of that very remarkable fact, the Italian rivers being constantly frozen over, is to be collected from a chapter in Ælian, which consists entirely of instructions how to catch eels, whilst the water is covered with ice : to this, without troubling you with a long citation, I shall barely refer. (See Lib. XIV. de Animal. cap. 29.)

Now, if we may believe the concurrent accounts of modern travellers, it would be almost as ridiculous to advise a method of catching fish in the rivers of Italy, which depended entirely upon their commonly being frozen over, as it would be to give such directions to an inhabitant of Jamaica.

I likewise cannot find that the precautions, which Virgil gives in his Georgics, against the damage which sheep and goats might receive from the snow and frost, are now necessary ; and both these animals are known to stand the severest winters of the High-

than its coolness, which is the circumstance most attended to, even in our northern climate.

He also mentions, that the situation was not warm enough either for olives or mirtle ; and that the *laurus* (which, whether it be the *bay* or *laurel*, bears our climate, except in seasons of extraordinary severity) would not then frequently stand the whole winter, neither at Laurentinum, nor near the town of Rome.

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lands of Scotland, conceived to be in Virgil's time almost the *ultima Thule*.

I do not pretend however to assert from this, that snow does not lye upon the Alps and Apennines, which arises from their very considerable height, nor that some waters on the tops of such mountains, or perhaps nearly under them, may not be frozen, especially when they are at a great distance from the sea.

We shall find however that the climate hath likewise, upon these very summits, become proportionably mild with that of the more level countries.

This receives a very clear and satisfactory proof, from the difficulties which those formerly encountered who passed the Alps.

Every line, almost, of both Livy's and Polybius's description of Annibal's passage, makes mention of frost and ice ; we know that these mountains have been easily crossed since by armies, from the time of Francis the first, to the war of 1743. They are likewise passed sometimes even by consumptive travellers during the winter.

It is now time, perhaps, to release you from this very long dissertation ; on a point, however, which seems to be of some curiosity and importance. I am,

Dear Sir,

Your most faithful,

humble servant,

Daines Barrington.